

HELLO from HILDEGARDE

Sorry -

I expect to see you  
at the Museum on  
Tuesday, Feb. 10. But  
just in case of rain  
I'm sending this by mail.

The "lower level"  
material is complete  
(I think!). I want to  
look over the bones  
from the upper beds  
a bit more before  
completing that Statement.

HH

Feb 6, 1981

Very Birds Introduction p. A  
for Barnes et al 1981

Fossil vertebrates, including 25 bird bones, were collected in the lower ~~white~~ sands at two sites opposite one another on Loretta Street: Locality LACM 4297 (=UCMP V68147) and UCMP V6880 and LACM 4298 (=UCMP V68144). At least seven extinct avian species are represented:

- 4297 Diomedea, indet. sp -- Albatross (1 bone)  
68147 Uria new sp. (Howard ms) -- Murre (9 bones)  
4297 Cephus new sp. (Howard ms) -- Guillemot (1 bone)  
4297 Aethia indet sp. -- Auklet (1 bone)  
4297 and 4298 Praemancalla sp. -- Flightless Auk (10 bones)  
Indeterminate spp. -- (3 bones)

About one-half mile farther north on Loretta Street, three bird bones were recovered at locality UCMP V68145 (=LACM 4299), in white sands, probably, though not certainly, of the same stratigraphic level as those found at localities LACM 4297 and 4298. Two extinct species are represented:

- 68145 Gavia sp. -- Loon (1 bone)  
68145 Praemancalla sp. -- Flightless Auk (2 bones)

From orange sands and conglomerates higher in the stratigraphic section 85 bird bones were recovered from locality LACM 4301 (=UCMP V68106). These have been referred as follows:

- Family ?Sulidae, indet. sp -- Booby? (1 bone) 119312  
Family Accipitridae, indet. sp. of eagle (1 bone) 119310  
Family Alcidae, indet. spp. -- auklets? (2 bones) 119360 121532  
Family Alcidae, subfamily Mancallinae, Mancalla sp. --  
Flightless Auk (81 bones)

list in  
order  
may  
be  
revised  
++



The occurrence of the genus Praemancalla in the lower, white sands and Mancalla in the deposits higher in the stratigraphic section is of importance in providing information as to the relative ages of the beds at the two levels. Both genera are members of the extinct subfamily Mancallinae, flightless auks of the family Alcidae. Praemancalla is known heretofore only from the Late Miocene, Monterey Formation, whereas Mancalla is a dominant genus in early to late Pliocene marine deposits of southern California and Cedros Island, Baja California, Mexico.



Lower Level Deposits

ANNOTATED LIST

AVES

ORDER GAVIIFORMES -- Loons

Family Gaviidae

Genus Gavia Forster 1788

Gavia sp.

Referred specimen.-- UCMP 88656, nearly complete tarsometatarsus, from locality UCMP 68145, collected August, 1968,

Discussion.-- This tarsometatarsus closely resembles that of modern species of loons, Gavia pacifica (Lawrence 1858) and G. stellata (Pontoppidan 1763). The only notable distinction is the very high posterior position of the distal foramen in the fossil specimen.

Four extinct species of loons have been recorded from the

Calif Tertiary of North America:

Gavia brodkorbi Howard 1978--Miocene, Monterey Formation, Orange County, California

Gavia concinna Wetmore 1940--Pliocene, Etchegoin Formation of Monterey County, San Diego Formation of San Diego County California, and Bone Valley Formation of Florida.

Gavia howardae Brodkorb 1953--Pliocene, San Diego Formation

Gavia palaeodytes Wetmore 1943--Pliocene, Bone Valley Formation, Polk County, Florida.

The tarsometatarsus has not been recorded for any of these species. It is, therefore, not appropriate to attempt to assign the specimen now at hand.



ORDER PROCELLARIIFORMES

Family Diomedidae -- Albatrosses

Genus Diomedea Linnaeus 1758

Diomedea sp.

Referred specimen.-- LACM 119353, distal end of left tibiotarsus, from locality LACM 4297, collected March 9, 1979.

Discussion.-- LACM 119353 resembles the tibiotarsus of the Recent Black-footed Albatross, Diomedea nigripes Audubon 1839, in the rounded contour of the external condyle (viewed laterally) and slight notch in the distal surface of the internal condyle. However, the fossil is narrower in the area of the ligamental bridge and is about 8 per cent smaller in over all breadth of the distal end.

Three fossil species of Diomedea have been described:

Diomedea anglica Lydekker 1891, from the Early Pleistocene and Late Pliocene of England and the Early Pliocene of Florida (see Brodkorb 1963:242); D. milleri Howard 1966 from the Middle Miocene, Sharktooth Hill Bonebed in Kern County, California; and D. californica Miller 1962 from the Sharktooth Hill Bonebed and, tentatively, (Howard 1978), from locality LACM 6906 in the Late Miocene, Monterey Formation in Orange County, California. A tarsometatarsal shaft of Diomedea sp., close in size to that of D. nigripes, also has been recorded (Howard 1968) from a slightly earlier facies of the Monterey Formation (LACM locality 1945) in Orange County. The Orange County specimen of D. ?californica and the Florida specimen of D. anglica are tibiotarsi; both are markedly larger than LACM 119353 from the San Mateo Formation. The holotype proximal end of an ulna ~~xxxxxxx~~ is the only recorded specimen of D. milleri. It is even smaller in proportion to the comparable element of D. nigripes than is the tibiotarsus from locality LACM 4297.



## ORDER CHARADRIIFORMES

Family Alcidae -- Auks, etc.

Genus Uria Brisson 1760 -- MurresUria new species (Howard ms)

of one individual,

Referred material.-- UCMP 88704, associated elements, including proximal end of right scapula, left and right coracoids (both lacking the head), complete left and distal end of right ulna, distal ends of left and right radii, distal end of left carpometacarpus, and wing phalanx digit 2, phalanx 2; from locality UCMP V68147, collected in August, 1968.

Discussion.-- The bones of this fossil specimen closely resemble comparable elements of Uria aalge (Pontoppidan 1763) and U. lomvia (Linnaeus 1759), the two species of living murres. The most notable distinctions are found in the scapula, coracoid and ulna (Howard ms). The dorsal surface of the <sup>fossil</sup>scapula is more concave, the coracoid is stouter and the scapular facet more cup-shaped, the ulna is shorter with a more rounded shaft.

The genus Uria was tentatively recorded from the Monterey Formation (Late Miocene) of Orange County (Howard 1978) based on a poorly preserved proximal portion of a humerus (LACM 52018 from locality LACM 6902). This specimen suggests the stockier proportions of the shaft compared with the humerus of U. aalge and U. lomvia that are noted here in the ulna/referred to Uria new species. Another, possibly somewhat larger species of the genus, from the Sisquoc Formation near Lompoc, California (Late Miocene) is under study (Howard ms). Although the latter specimen (Pierce Brodkorb coll. 7960) also includes associated <sup>wing</sup>skeletal elements, only the details of the scapula can be compared with UCMP 88704. They appear to be different.



There are no other records of the genus for the Tertiary of California. The only other record for North America is Uria antiqua (Marsh 1870) from ~~xxxxxxxxxx~~ Edgecombe County, North Carolina, of either Miocene or Pliocene age. According to <sup>Storrs</sup> Olson (ms) <sup>the holotype humerus of</sup> this species is wrongly assigned to the genus Uria.

Genus Cepphus Pallas 1769 --Guillemot

Cepphus, new species (Howard ms)

Referred specimen.--LACM 107032, right complete humerus, from locality LACM 4297, collected in March, 1975.

Discussion.--The shaft of this <sup>m</sup>humerus has the curvature found in humeri of species of the genera Uria, Alca Linnaeus 1758 and Cepphus as distinguished from the straighter shaft found in the puffins of the genera Fratercula Brisson 1760 and Lunda Pallas 1811. The fossil specimen is distinguished from the humerus in Uria and Alca, however, by the less bladelike compression of the shaft. It resembles this element of Cepphus columba Pallas 1811, the living Pigeon Guillemot, in this character, but is shorter, with distinctive characters of the pectoral attachment, deltoid crest and ectepicondylar process (Howard ms).

The genus Cepphus was tentatively recorded (Howard, 1978) from the Late Miocene Monterey Formation of Orange County (locality LACM 6906). While the specimen, an ulna (LACM 47045), suggests a species comparable in size to the <sup>one represented by the</sup> humerus from Oceanside, there is no clear indication that the two elements represent the same species. There are no other fossil records of Cepphus.



Genus Aethia Merrem 1788 -- Auklet

Referred specimen.-- LACM 107031, left humerus lacking proximal end, from locality LACM 4297, <sup>in Lawrence Canyon</sup> collected in March, 1975.

Discussion.-- This small auklet humerus resembles the referred humerus (LACM 18949) of Aethia rossmoori Howard 1968 from the type locality of that species in the Late Miocene, Monterey Formation of Orange County (locality LACM 1945). It also resembles humerus LACM 37686 from a slightly later facies of the Monterey Formation in Orange County (locality LACM 6906) recorded (Howard, 1978) as ?Aethia sp. Similarities are noted in the rounded shaft, brachial impression bordered externally by a slight rise, and attachment of anterior articular ligament facing more palmar than laterally. In size the Oceanside bone (LACM 107031) falls between the two previously recorded humeri. All three fossils differ from modern specimens of Aethia pusilla (Pallas 1811) and A. pygmaea (Gmelin 1789) in greater depression of the brachial area and difference in position of the attachment for the anterior articular ligament. Distally, LACM 107031 is further distinguished from the humerus of living species of Aethia in lacking the deep depression between the internal and medial tricipital ridges. This condition is suggested also in the specimen from LACM locality 6906.



## Subfamily Mancallinae -- Extinct Flightless Auks

Genus Praemancalla Howard 1966Praemancalla sp.

Referred material.--Twelve bones, of which six are of one individual, and one is tentatively assigned. From localities LACM 4297 and its equivalent UCMP V68147, <sup>and from</sup> LACM 4298, and UCMP V68145, as follows:

From locality LACM 4297: LACM 107028, associated skeletal elements of one individual consisting of carpometacarpus, ulna, tibiotarsus, tarsometatarsus, pedal phalanx and thoracic vertebra; LACM 107030, scapular end of coracoid, badly abraded; all collected in March, 1975. LACM 119406, sacrum with incomplete pelvic bones of right side, collected in May, 1979. From locality UCMP V68147, UCMP 102428, axis vertebra, collected in August, 1968.

From locality LACM 4298: LACM 107029, nearly complete right humerus, collected in March, 1975.

From locality UCMP V68145: UCMP 95119, proximal end of left scapula, badly abraded; UCMP 95118, tentatively assigned left femur lacking proximal end, and abraded distally. Both collected in May, 1970.

Discussion.-- Praemancalla is the best represented genus in the lower level deposits.

The mancalline auks of the genera Mancalla Lucas 1901 and Praemancalla are distinguished from Recent genera and species of the family Alcidae by the compression of the shaft of the wing bones and the shortening of the ulna and carpometacarpus.. These characters are associated with a specialization toward a flipper-like wing, a specialization that is more advanced in Mancalla than in Praemancalla.



The <sup>five</sup> ~~four~~ known species of Mancalla were described from Pliocene deposits in California and Baja California, Mexico. The two species of Praemancalla are from the Late Miocene, Monterey Formation in Orange County, California.

The wing and shoulder girdle bones here referred to Praemancalla are distinguished from those of the several species of Mancalla as follows: Humerus with deltoid crest poorly developed, capital groove forming a wide angle, and distal end lacking a papilla on the palmar surface above the condyles; ulna with a prominent olecranon; carpometacarpus with a raised pisiform process; coracoid with more medially, less posteriorly, oriented triosseal canal; scapula with flatter ventral surface of the proximal end and longer acromion. The sacrum and axis vertebra resemble those of Mancalla diegensis (Miller 1939) and M. cedrosensis Howard 1971, though with certain small distinctions. These distinctions, combined with the larger size of the Oceanside specimens (as observed, also, in the vertebra associated with the Praemancalla wing bones of LACM 107028), justify assignment to Praemancalla.

The large femur (UCMP 95118) is distinctly different than that of any Recent species. In its relatively slender shaft, combined with a bend toward the median side distally, it suggests the conformation of the holotype femur of M. diegensis. It differs from this specimen and the femora of all species of Mancalla, however, in the depression of the shaft adjacent to the fibular crest. Because the size of this femur is commensurate with that of the tibiotarsus and tarsometatarsus associated with the wing elements of Praemancalla in specimen LACM 107028, a tentative assignment to Praemancalla is ventured.



Of the two previously described species of Praemancalla, P. lagunensis Howard 1966, from the lower facies of the Monterey Formation in Orange County (Locality LACM 1945), and P. wetmorei Howard 1976 from the later facies of the same formation (localities LACM 1906, 1902, and 3185) only the carpometacarpus, humerus and coracoid are known for both. The ulna and radius are recorded only for P. wetmorei, the scapula for P. lagunensis. On the basis of comparison of the Oceanside bones with comparable elements from the Monterey Formation, it is suggested that P. wetmorei may be the species represented.

#### AVES species indeterminate

Material available.-- UCMP 88597, an incomplete clavicle from locality UCMP V6880, collected in 1968; UCMP 88646, a scapular blade from locality V68144, collected in June, 1969; UCMP 88640, a pedal phalanx from locality UCMP V68144, collected in August, 1968.

Discussion.-- The clavicle is suggestive of this element in the falcons (family Falconidae) in the prominent, round coracoidal facet. There are no other identifying characters in this, or in the scapular blade or pedal phalanx.



ORDER CHARADRIIFORMES

Family Alcidae -- Auks, etc.

Subfamily Mancallinae -- Extinct Flightless Auks

Genus Mancalla Lucas 1901

Mancalla sp.

Referred material.-- From locality LACM 4301 (=UCMP V68106), 30 humeri (1 complete, LACM 19165), 13 ulnae (8 complete, LACM 119279-119283, 119286, 119288-119289), 10 coracoids (1 nearly complete (UCMP 88614), 9 scapulae, 6 tibiotarsi, 5 tarsometatarsi (1 complete, LACM 119298), 3 carpometacarpi, 2 pedal phalanges, 1 radius, 1 wing phalanx, 1 thoracic vertebra. A total of 81 bones.

Description.--Preservation of this material is imperfect, but those elements that have been previously described for Mancalla and Praemancalla clearly show the characteristics of the former.

In the humeri the capital groove is notch-like, and a papilla is present above the tip of the distal condyles. In the ulnae the olecranon is level with the cotylae, not projecting proximally, and at the distal end there is no projection overhanging the tendinal pit. The radius is bladelike; the carpometacarpi lack a distinct pisiform process. The coracoids have the triosseal canal dorsally (posteriorly) oriented, and the scapular facet laterally placed. The scapulae are markedly concave on the ventral surface, the acromion is short, the glenoid facet medially projected. The tibiotarsi lack the notable flare of the distal end observed in the tibiotarsus associated with the wing bones of Praemancalla<sup>LACM</sup> (107028) in locality LACM 4297. In those tarsometatarsi in which the shaft is preserved, the anterior face is depressed along the external side, but acutely raised above the middle trochlea.



Discussion.-- There are five previously recorded species of Mancalla: Mancalla californiensis Lucas 1901, with the holotype humerus from the early Pliocene (Repetto Formation) in Los Angeles, and with eleven specimens (including humeri, ulna, radius, carpo-metacarp, coracoid, tibiotarsus, tarsometatarsi and vertebra) from the Repetto Formation in Corona del Mar, Orange County, California, referred (Howard 1949:196 and 1970:3); M. cedrosensis Howard 1971, the holotype a nearly complete skeleton, with many referred specimens all from the middle Pliocene (Almejas Formation) of Cedros Island, Baja California, Mexico; M. diegensis (Miller 1937) and M. milleri Howard 1970, both described and well represented in the late Pliocene (San Diego Formation) in the city of San Diego, California; M. emlongi Olson 1981, (in press) known only from the holotype humerus from the late Pliocene

The genus Mancalla is also abundantly represented in the Capistrano Formation in Laguna Hills and Mission Viejo, Orange County, California, but this material has not yet been studied in detail. Until such study is made, it would be unwise to attempt definite specific assignment of the bones from locality LACM 4301, particularly in view of their poor preservation.



Re: San Mateo birds —

Larry McNair

Mancalla californiensis Lucas 1901 holotype from the Repetto Formation of Los Angeles, California; referred specimens of M. californiensis from Orange County were also found in association with Foraminifera of the Repetto ~~fauna~~ fauna. (Howard 1949)

Type localities of M. diegense and M. milleri both in the San Diego Formation of San Diego, Calif. Based on molluscan fauna of the San Diego Formation, these deposits have been considered to be of Middle to Late Pliocene age (Hertlein and Grant, 1954). M. cedrosensis from Cedros Island, Baja California, Mexico, occurs in the Almejas Formation which has been recorded as Early Pliocene (Howard, 1971, Barnes, 1973).



Gavia sp. .... X  
~~Pomarine~~ Falconidae, sp. .... XX  
 Uria, n. sp. .... X  
 Cepphus, n. sp. .... X  
 Aethia, sp. .... X  
 Praemancalla wetmorei . . X .. X . . . . . ? . . . . ?  
 Indet. sps. . . . . X

Mancalla - - - - - X - - - - - X  
 Eagle sp. ? - - - - - X  
 Sulid sp. ? - - - - - X  
 Alcidac sp - - - - - X  
 Indet. sps. - - - - -

LArm  
 4297  
 LArm  
 412982  
 V 6880  
 V 6881  
 V 68106  
 V 68144  
 V 68145  
 V 68146  
 V 68147  
 V 68148  
 LArm 4301



Table 16 Preliminary Vertebrate Faunal List for the San Mateo Formation.

Taxa are indicated by X for occurrence at a UCMP vertebrate locality.

| Taxon                                            | V-6880 | V-6881 | V-68106 | V-68144 | V-68145<br><i>1/2</i> | V-68146 | V-68147 | V-68148 |
|--------------------------------------------------|--------|--------|---------|---------|-----------------------|---------|---------|---------|
| <u>Hexanchus</u> sp. ....                        |        |        |         |         |                       |         |         | X       |
| <u>Isurus</u> cf. <u>I. oxvrynchus</u> .....     |        |        |         | X       |                       |         |         |         |
| <u>Isurus</u> cf. <u>I. hastalis</u> .....       |        | X      |         | X       | X                     |         |         |         |
| <u>Carcharodon</u> cf. <u>C. sulcidens</u> ..... | X      | X      | X       |         | X                     |         | X       | X       |
| Isuridae .....                                   |        |        |         |         | X                     |         |         |         |
| <u>Myliobatis</u> sp. ....                       |        |        |         | X       | X                     |         |         |         |
| Teleostomi .....                                 |        |        | X       | X       | X                     |         |         |         |
| Salmonidae .....                                 | X      |        |         |         | X                     |         | X       |         |
| Scianidae .....                                  |        |        |         | X       |                       |         |         |         |
| Serranidae .....                                 |        |        |         | X       |                       |         |         |         |
| Aves .....                                       |        |        |         |         |                       |         |         |         |
| aff. <u>Phocoena</u> .....                       |        |        |         |         |                       |         |         |         |
| <u>Stenella</u> cf. <u>S. pliocenica</u> .....   |        |        |         |         |                       |         |         |         |
| Delphinidae .....                                |        |        | X       | X       | X                     |         |         |         |
| <u>Scaldicetus</u> cf. <u>S. grandis</u> .....   |        |        |         |         |                       |         | X       |         |
| aff. <u>Herpetocetus</u> .....                   |        |        |         |         | X                     |         |         |         |
| <u>Balaenula</u> sp. ....                        | X      |        |         |         |                       |         |         |         |
| <u>Arctocephalus</u> sp. ....                    |        |        |         | X       | X                     |         |         |         |
| Otariinae, large .....                           | X      |        | X       | X       | X                     |         |         | X       |
| Odobenidae .....                                 |        |        | X       |         |                       |         |         |         |
| <u>Plihippus</u> .....                           |        |        |         |         | X                     |         |         |         |
| Artiodactyla .....                               |        |        |         |         | X                     |         |         |         |
| Camelidae .....                                  |        |        |         |         | X                     |         |         |         |
| <u>Hydrodamalis</u> .....                        |        |        | X       |         | X                     | X       | X       | X       |

*mptor*  
X?

*Manilla*

X

X?  
ESP.

*Prorhynchella cf. diagenese*

X  
*Gavia* sp.

X *Uria*  
*Gavia*

*Prorhynchella?*

X-San Diego



OLD

| Epoch             | Fm.        | Age                             |                                 |
|-------------------|------------|---------------------------------|---------------------------------|
| Pleist.           | Niguel     | Blancan                         |                                 |
| 1-2 million years |            | (Forams: Repettian)             | 65120, 65121<br>3221,           |
| Plioc.            | Capistrano | Hemphillian                     |                                 |
| 10 million years  |            | (Forams: Mohntian - Delmontian) | 3185<br>6906, 6901, 7136        |
| Mioc.             | Monterey   | Clarendonian                    | 1945 [Desmostylus]<br>3112      |
|                   |            | (Forams: Luisian - Relizian)    |                                 |
|                   |            | Barstovian                      | Pecten Reef<br>Relizian-Luisian |
|                   |            | 12 million                      |                                 |

